CLAIMS

1. A tunable optical element comprising:

a moveable path changing optical element adapted to receive light in a first optical beam on a first path and provide the light in a second optical beam on a second path, the second path being dependent on the position of the moveable path changing optical element; and

a position dependent optical element receiving the light in the second optical beam, the position dependent optical element changing a spectral characteristic of the light depending on the position of receipt of the light in the second optical beam by the position dependent optical element.

2. The tunable optical element of claim 1 wherein the moveable path changing optical element is a mirror.

3. The tunable optical element of claim 2 wherein the mirror is rotatable about an axis.

4. The tunable optical element of claim 3 wherein the mirror is a MEMS mirror.

5. The tunable optical element of claim 4 wherein the position dependent optical element is a Fabry-Perot filter formed of reflective front and rear surfaces, with the distance between the front and rear surfaces varying with location.

6. The tunable optical element of claim 5 wherein the Fabry-Perot filter is wedge shaped.

7. The tunable optical element of claim 5 wherein the Fabry-Perot filter is a wedge shaped etalon.

8. The tunable optical element of claim 5 wherein the Fabry-Perot filter is formed of a number of discrete steps of varying cavity length.

9. The tunable optical element of claim 5 further comprising a detector receiving light spectrally changed by the position dependent optical element.

10. The tunable optical element of claim 9 further comprising optics collimating the light in the second optical beam.

11. The tunable optical element of claim 10 further comprising a controller commanding adjustments in the position of the mirror.

12. The tunable optical element of claim 1 wherein the position dependent optical element is an interferometer having different resonant wavelengths along the length of the interferometer.

13. The tunable optical element of claim 12 further comprising a fiber providing light in the first optical beam and receiving light with a spectral characteristic changed by the interferometer.

14. The tunable optical element of claim 13 further comprising an optical circulator providing light to the fiber and receiving light from the fiber.

15. The tunable optical element of claim 1 wherein the position dependent optical element has different

reflectivities for different polarizations, the reflectivity varying spatially across the position dependent optical element.

16. The tunable optical element of claim 15 further comprising a fiber providing light in the first optical beam and receiving light with a spectral characteristic changed by the interferometer.

17. The tunable optical element of claim 16 further comprising an optical circulator providing light to the fiber and receiving light from the fiber.

18. The tunable optical element of claim 1 wherein the position dependent optical element is an array of waveguides, with different waveguides having different spectral characteristics.

19. An optical device comprising:

a spatially varying optical unit, the spatially varying optical unit adapted to receive light provided on a plurality of paths, the spatially varying optical unit varying a spectral characteristic of received light depending on the path of the light; and

means for providing light to the spatially varying optical unit on any one of the plurality of paths.

20. The optical device of claim 19 wherein the spatially varying optical unit changes the phase of the light varying amounts based on the wavelengths present in the light.

21. The optical device of claim 20 wherein the spatially varying optical unit is an interferometer with a spatially varying cavity length.

22. The optical device of claim 20 wherein the spatially varying optical unit changes the dispersion of the light.

23. The optical device of claim 19 wherein the spatially varying optical unit filters the light based on wavelength.

24. The optical device of claim 23 wherein the spatially varying optical unit is a Fabry-Perot filter with a spatially varying cavity length.

25. The optical device of claim 23 wherein the spatially varying optical unit is a reflector, the reflectivity of the reflector spatially varying.

26. The optical device of claim 25 wherein the reflector has varying reflectivities for varying polarities spatially across the reflector.

27. The optical device of claim 19 wherein the spatially varying optical unit is an array of waveguides each having different characteristics.

28. The optical device of claim 27 wherein each of the waveguides has gratings, the gratings having different spacings for different waveguides.

29. An optical device comprising:

means for reflecting light on a first path to any one of a plurality of second paths; and

means for receiving light on at least two of the second paths and changing a spectral characteristic of the light depending on the path of the light.

30. A method of changing a spectral characteristic of light comprising:

receiving light on a first path;

transferring the light on the first path to a selected path of any one of a plurality of second paths;

changing a spectral characteristic of the light depending on the selected path.